

**Abstract**

## Frequency Tracking Loop and Method of Frequency Tracking.

The invention comprises a frequency tracking loop and method of frequency tracking for a digital radio communications system. The invention also extends to a digital radio communications receiver which comprises a frequency tracking loop in accordance with the invention, and a mobile- or a portable radio, or a mobile telephone, comprising such a receiver.

The frequency tracking loop (100) comprises: a mixer (122) for correcting frequency offset of an input radio signal comprising bursts of known data; a frequency offset estimator (134), for providing an estimate of frequency offset; a variable bandwidth filter (142), for providing a filtered signal; an oscillator (146) for supplying the second input of the mixer with a signal whose frequency depends on the filtered signal; the frequency tracking loop (100) is adapted to change the bandwidth of the variable bandwidth filter (142) in dependence on at least one characteristic of the currently received burst of known data. The frequency tracking loop (100) may be adapted to change the bandwidth of the variable bandwidth filter (142) in dependence on the length of the currently received burst of known data. The burst of data may be a training sequence.

The frequency tracking loop and method provide optimum bandwidth for tracking a radio signal which may suffer variable offsets from a nominal frequency value.

Figure 2